

CLAIMS

1. A for winding outwardly spooled multi-pole stators, said stators formed
by a sheets stack ferromagnetic core, having an axis, a plurality of
radially extending poles defining grooves between them, and a
5 terminal board that coats in part the core and has a plurality of hooks;
wherein the wire is wound about the pole extensions, spooled by a
flier, and guided by shrouds which move radially with respect to the
stator overlapping the respective pole extension; and wherein, before
and/or after winding, fastening operations are provided of the wire
10 about the hooks by the flier comprising the steps of:
 - a) prearranging a shroud;
 - b) winding a coil on said pole and moving said shroud towards said
hook for completing winding;
 - c) approaching said shroud to said hook to make a guide for said
15 wire on said hook;
 - d) rotating said flier about its own axis in order to deposit the wire
onto said hook; e) withdrawing said shroud;
 - f) indexing the stator and winding a next co
2. The of Claim 1, wherein said shroud has a housing suitable for
20 receiving the hook, and further comprising a step g) overlapping
the shroud to the hook causing said hook to enter said housing, to
make a guide for the wire on said hook, and said step e) of
withdrawing said shroud allows said hook to disengage from said
housing.

3. The method of Claim 2, wherein if the wire forms a loop or “alpha” about the hook, further comprising of steps steps :
- 5 h) rotating a first time said flier about its own axis in order to deposit the wire onto said hook;
- i) withdrawing said shroud up to disengaging said hook from said housing;
- j) shielding said hook by means of a shield in order to force the wire at a chosen position;
- 10 k) rotating a second time rotation said flier about its own axis opposite to said first rotation, in order to form a loop, substantially an alpha-shaped loop, about said hook, owing to the wire sliding on said shield; and
- l) indexing the stator and winding a next coil.
- 15 4. The method of claim 3, wherein said shroud disengages from said hook for allowing said shield to move between said shroud and said hook after said rotation of the flier for depositing said wire onto said hook.
5. An apparatus Machine for winding multi-pole stators, wherein said stators are formed by a sheets stack ferromagnetic core, having an axis,
- 20 a plurality of radially extending poles defining grooves between them, and a terminal board that coats in part the core and has a plurality of hooks; comprising at least one flier and at least one shroud that moves radially with respect to said stator overlapping a respective pole extension, said shroud comprises means for guiding said wire on said
- 25 hook during said termination step of said wire onto said hook.
6. The apparatus of Claim 5, wherein on said shroud, on a face oriented towards said stator, a housing is made suitable for receiving a portion of said hook, to make a guide for said wire on said hook.

- 5 7. The apparatus of Claim 5, wherein said wire forms a loop or “alpha” about said hooks further comprising movable shield is arranged between a disengaged position and an engaged position between said hook and said shroud, suitable for keeping said wire at a forced position, for preventing said wire from disengaging from said hook when said flier moves backwards.
8. The apparatus of Claim 5, wherein said shield, which covers said hooks during said termination step, has cylindrical shape co-axial to said stator, and moves axially to said stator.
- 10 9. The apparatus of Claim 5, wherein said shield, which covers said hooks during said termination, has open shape with at least a rounded edge, for allowing said wire to slide and preventing in said hooking step said wire from being damaged by said shield.
- 15 10. The apparatus of Claim 5, wherein said cylindrical shield is peripherally equipped with at least a locking element that in use is arranged at a hook of said stator during termination.
11. The apparatus of Claim 10, wherein said shield has a plurality of teeth oriented towards below for engaging and backing said hook, avoiding deformation and break of said hook owing to bending actions or hits which might occur at said winding and termination steps.
- 20 12. The apparatus of Claim 10, wherein said locking element comprises a central stiffening portion that in use is positioned to back said hook and two side portions suitable for blocking said hook with respect to said stator and guiding said wire during termination.
- 25 13. The apparatus of Claim 10, wherein said locking element has, furthermore, a protrusion or “tooth” so that said hook is constrained between said central stiffening portion and said tooth in order to limit further any possibility of movement.